



REPORT

Technical Report: (5106)010-0140 REVISION

Page 1 of 1
June 7, 2006



Index	
Cover	1 Page
Report	3 Pages
Protocol	9 Pages
Exhibits	N/A
Other	N/A

Bureau Veritas

Consumer Products Services, Inc.

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Technical Report: (5106)010-0140 Revision
Date Received: January 10, 2006

June 7, 2006
Page 1 of 3

DIRECTORATE FOR ENGINEERING SCIENCES
US CONSUMER PRODUCTS SAFETY COMMISSION
4330 EAST WEST HIGHWAY
ROOM 611
BETHESDA, MD 20814

Sample Description:	CIGARETTE LIGHTERS - L	SKN/SKU No.:	N/A
Vendor:	US CONSUMER PRODUCTS SAFETY COMMISSION	PO No.:	N/A
Manufacturer:	ZIPPO MANU. CO.	Ref #:	N/A
Buyer:	N/A	Country of Origin:	UNITED STATES
UPC Code:	N/A	Assortment No.:	N/A
Sample Size:	10		
Style No(s):	06-810-2613		

EXECUTIVE SUMMARY:

At the request of the client, the submitted sample was evaluated per the applicable sections of Bureau Veritas Consumer Products Services test protocol MC-4085-US, Lighters (ASTM F400).

NOTE:

- At the request of the client the labeling and refilling sections of the protocol were evaluated for reference only
- The submitted samples did not include refilling instructions. Refilling was performed as follows:
 - 1) Held case in one hand, while using other hand to remove lighter insert.
 - 2) Lifted felt pad to reveal the packaging material.
 - 3) Filled fuel chamber to the top of the packaging.
 - 4) Inserted lighter back into case.
- At the request of the client the Lead in Surface Coatings were not tested.

NOTE: Revision for corrections to protocol.

Bureau Veritas
Consumer Products Services, Inc.

Mark Gerwitz, CQE, CRE
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Bureau Veritas
Consumer Products Services, Inc.

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Product Test Engineer,
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/kv

cc: SHIVANI MEHTA, US CONSUMER PRODUCTS SAFETY COMMISSION



US CONSUMER PRODUCTS SAFETY COMMISSION

Technical Report: **(5106)010-0140R**

June 7, 2006

Page 2 of 3

RESULTS:

BV #	5106-010-0140
Tech	DB
# of Lighters	10
Company	06-810-2613
Date	February 9, 2006
Adjustable or Non-Adjustable	N

Labeling	
Safety and Warnings	10
Product Markings	10
Retail Shel Packaging	10

Analytical		Lighter #
Lead in Surface Coatings	1	NT

Physical Characteristics		Lighter #
Dimensions	1	9
Weight	1	9

Compatibility 28 days @ 104 F	1	Lighter #
		3

Workmanship	
External Finish	10

Performance		Lighter #'s
Flame Generation	8	1,2,4,5,6,7,8,10
Flame Control	8	1,2,4,5,6,7,8,10
Flame Height Adjustment	8	1,2,4,5,6,7,8,10
Spitting Sputtering Flaring	8	1,2,4,5,6,7,8,10
Flame Extinction	4	2,7,8,10



US CONSUMER PRODUCTS SAFETY COMMISSION

Technical Report: **(5106)010-0140R**

June 7, 2006

Page 3 of 3

RESULTS:

Volumetric	1	Lighter #
		NA

Drop Test		Lighter #
24 hrs @ 14 C 3 Drops	1	7
10 Hours @ 23 C 3 Drops	1	8
Section 4	2	7,8

Temperature Test		Lighter #
4 hours @ 65 C	1	2
Section 4	1	2

Burning Test		Lighter #
10 sec @ 45 deg	4	2,7,8,10

Continuous Burn		Lighter #,s
2 minute Burn	4	1,4,5,6

Cycling Burn		Lighter #,s
10 cycles for 20 sec	4	2,7,8,10
Section 4	4	2,7,8,10

Pressure Test	1	Lighter #
		10

Refilling of Lighters	1	Lighter #
		2



**BUREAU
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BV Lab Number: **(5106) 010-0140R**
Technician Name: **JRF**
Test Date: **January 27, 2006**
Reviewed By/Date: **PE March 27, 2006**

BUREAU VERITAS TEST PROTOCOL FOR
MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
LABELING					
Instructions and Warnings	ASTM F400-04, Section 7.1	All	All lighters shall be accompanied by the appropriate instructions or warnings, or both, communicating proper method of use.	Not Present	-
	ASTM F400-04, Section 7.2	All	This safety information shall be conspicuously placed on the product or on a separate brochure or pamphlet packaged with the lighters or on a product packaging at the point of sale with contrasting background color, type size, or style that makes it distinct from other information.	Present	-
	ASTM F400-04, Section 7.3	All	For all lighters, the safety information shall be accompanied in close proximity by the specific signal word "WARNING."	Present	-
	ASTM F400-04, Section 7.4	All	For all lighters, the safety information shall contain the following statements:	See Below	-
	ASTM F400-04, Section 7.4.1	All	"Keep away from children" or "keep out of reach of children"	Present	-
	ASTM F400-04, Section 7.4.2	All	Ignite lighter away from face and clothing.	Present	-
	ASTM F400-04, Section 7.5	All	Use one of the following as appropriate for the lighter type:	See Below	-
	ASTM F400-04, Section 7.5.1	All	Be sure flame is out after use. (Self-extinguishing lighters)	N/A	-
	ASTM F400-04, Section 7.5.2	All	This lighter does not self-extinguish; close cover to put out. (Non-self-extinguishing lighters)	Present	-
	ASTM F400-04, Section 7.6	All	For all lighters, the safety information may include the substance of the following as appropriate for the lighter type:	See Below	-
	ASTM F400-04, Section 7.6.1	All	Contains flammable gas under pressure.	N/A	-
	ASTM F400-04, Section 7.6.2	All	Contains flammable fluid.	Not Present	-
	ASTM F400-04, Section 7.6.3	All	When filled, will contain flammable fluid.	Not Present	-
	ASTM F400-04, Section 7.6.4	All	Never expose to heat above 120°F (49°C) or to prolonged sunlight.	Not Present	-
	ASTM F400-04, Section 7.6.5	All	Never puncture or put in fire.	Not Present	-



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MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
	ASTM F400-04, Section 7.6.6	All	Extreme heat is present above the visible flame. Extra care should be taken to prevent burn injury or fire. (premixing burner lighters)	N/A	-
	ASTM F400-04, Section 7.6.7	All	Do not keep lit for more than 10 seconds. (premixing burner lighters)	N/A	-
	ASTM F400-04, Section 7.7	All	Refillable gas lighters shall be accompanied by specific instructions as to the correct procedure to accomplish the refill operation, including type of fuel recommended.	N/A	-
	ASTM F400-04, Section 7.8.1	All	Fluid lighters shall be accompanied by the substance of the following:	N/A	-
	ASTM F400-04, Section 7.8.1.1	All	Fill only with the type of fluid recommended by the manufacturer.	N/A	-
	ASTM F400-04, Section 7.8.1.2	All	Fill slowly, never overfill.	N/A	-
	ASTM F400-04, Section 7.8.1.3	All	Wipe lighter and hands dry before igniting.	N/A	-
Product Markings	ASTM F400-04, Section 8	All	All lighters shall bear a permanent logo or name that identifies the manufacturer or distributor.	Present Zippo	-
PACKAGING					
Retail Shelf Packaging	TM-HL-0002	All	Shall have final retail shelf packaging with scannable UPC stamp/label. Scanned numbers shall match as per supplied UPC label.	NT Per Client Request	-
ANALYTICAL					
* Lead In Surface Coating	ASTM E1613-04 / E1645-01 (Mod.)	1	Shall not exceed 600 ppm (0.06% by weight) total lead.	NT Not Requested	-
PHYSICAL CHARACTERISTICS					
Dimensions (If Specified)	TM-HL-0001	1	Report overall dimensions. L x W x H (cm)	5.6 x 3.8 x 1.2 cm	-
Weight (If Specified)	TM-HL-0001	1	Report weight.	56.3 g	-
CONSTRUCTION & WORKMANSHIP					
Defects	TM-HL-0002	All	Shall be free of aesthetic defects and shall meet the structural requirements as tested under IV. Performance.	M	PASS



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Technician Name: JRF

MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
PERFORMANCE					
Flame Generation	ASTM F400-04, Standard Consumer Safety Specification for Lighters	1	Lighters shall require a deliberate manual operation to produce a flame. These operations shall conform to at least one of the following requirements:	See Below	-
	ASTM F400-04, Section 4.1.1	1	A system such that positive action on the part of the consumer is required to generate and maintain a flame.	M	PASS
	ASTM F400-04, Section 4.1.2	1	A system that requires two or more independent motions to generate a flame.	N/A Meets Previous	-
	ASTM F400-04, Section 4.1.3	1	A system that requires an actuating force equal to or greater than 3.4 lbf (15 N) to generate a flame.	N/A Meets Previous	-
Flame Control	ASTM F400-04, Section 4.2	1	The maximum attainable flame height for lighters shall be limited with a setting or by product design, or both.	M Product Design	PASS
	ASTM F400-04, Section 4.2.1 when tested in accordance with 8.1.	1	Nonadjustable fluid lighters:	See Below	-
		1	Shall not be capable of producing a flame height greater than 4.75 in. (120 mm).	M	PASS
	ASTM F400-04, Section 4.2.2 when tested in accordance with 8.1.	1	Nonadjustable postmixing and premixing burner lighters:	See Below	-
		1	Shall have a maximum attainable flame height of no more than 2 in. (50 mm).	N/A Fluid	-
	ASTM F400-04, Section 4.2.3 when tested in accordance with 8.1.	1	Adjustable postmixing burner Lighters:	See Below	-
		1	Shall not be capable of producing a flame height greater than 4.75 in. (120 mm) when deliberately adjusted by the consumer for maximum flame height.	N/A Fluid	-
	ASTM F400-04, Section 4.2.4, when tested in accordance with 8.1.	1	Adjustable premixing burner lighters:	See Below	-



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BV Lab Number: (5106) 010-0140R

Technician Name: JRF

MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
		1	Shall not be capable of producing a flame height in excess of 3 in. (75 mm) when deliberately adjusted by the consumer for maximum flame height..	N/A Fluid	-
	ASTM F400-04, Section 4.2.5, when tested in accordance with 8.1.		Adjustable postmixing burner lighters:	See Below	-
		1	The first strike will not produce a flame height in excess of 4 in. (100 mm).	N/A Fluid	-
	ASTM F400-04, Section 4.2.6, when tested in accordance with 8.1.	1	Adjustable premixing burner lighters:	See Below	-
		1	The first strike will not produce a flame height in excess of 2.5 in. (60 mm).	N/A Fluid	-
	ASTM F400-04, Section 4.2.7, when tested in accordance with 8.1.	1	All adjustable flame height lighters:	See Below	-
		1	Shall not be capable of producing a flame height in excess of 2 in. (50 mm) when set at the lowest possible flame height..	N/A Fluid	-
Flame Height Adjustment	ASTM F400-04, Section 4.3	1	Adjustable lighters shall require a deliberate manual operation to increase the flame height when the lighter is used in the normal fashion.	N/A Non Adjustable	-
	ASTM F400-04, Section 4.3.1	1	Flame control actuators protrude from the body of the lighter. Shall require a minimum actuating force of 0.25 lbf (1 N) applied over the entire range of adjustment in a tangential direction.	N/A Non Adjustable	-
	ASTM F400-04, Section 4.3.2	1	Adjustable gas lighters having rotary movement flame control actuators approximately at right angles to the flame shall perform as follows:	See Below	-
	ASTM F400-04, Section 4.3.2.1	1	The flame control actuator is at the top of the lighter.	N/A	-
		1	Moving the actuator to the left shall produce a decrease in flame height.	N/A	-
	ASTM F400-04, Section 4.3.2.2	1	The flame control actuator is at the bottom of the lighter.	N/A Fluid	-
		1	A clockwise movement shall produce a decrease in flame height.	N/A Fluid	-



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MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
	ASTM F400-04, Section 4.3.3	1	Adjustable gas lighters requiring motion of the flame control actuator approximately parallel to the flame axis shall decrease or increase the flame height according to the direction of the movement.	N/A Fluid	-
	ASTM F400-04, Section 4.3.4	1	Adjustable flame height lighters.	See Below	-
		1	Shall indicate the direction of movement to produce a higher or lower flame height.	N/A Non Adjustable	-
	ASTM F400-04, Section 4.3.4	1	On lighters whose adjusting mechanisms conform to sections 4.3.2 and 4.3.3, the direction of movement shall be permanently imprinted or engraved on the lighter or may be of a nonpermanent tag or stick-on label, in the vicinity of the adjusting mechanism and be readily visible and understandable.	N/A Non Adjustable	-
	ASTM F400-04, Section 4.3.5	1	On lighters whose adjusting mechanisms do not conform to sections 4.3.2 and 4.3.3, the direction of movement shall be permanently imprinted or engraved on the lighter, in the vicinity of the adjusting mechanism and be readily visible and understandable.	N/A Non Adjustable	-
Spitting or Sputtering and Flaring	ASTM F400-04, Section 4.4, when tested in accordance with 8.2.	1	Gas lighters when set at the maximum flame height, shall exhibit no spitting or sputtering, or flaring.	N/A Fluid Lighter	-
Flame Extinction	ASTM F400-04, Section 4.5.1, when tested in accordance with 8.3	1	Adjustable postmixing burner lighters, after a 5-second burn at maximum flame height, when extinguished in the intended manner, shall have any exposed flame completely extinguished within 2 seconds.	M	PASS
	ASTM F400-04, Section 4.5.2, when tested in accordance with 8.3.	1	Adjustable postmixing burner lighters at a flame height of 2 in. (50 mm), or the maximum height of adjustment allows, or nonadjustable postmixing burner lighters at their permanently set flame heights, after a 10 second burn:	See Below	-
		1	When extinguished in the intended manner, shall have any exposed flame completely extinguished within 2 seconds after such action is completed.	M	PASS
		1	For gas lighters that have shields, an additional 2 second afterburn is acceptable if the flame height does not extend above the shield.	Meets Previous	-



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BV Lab Number: (5106) 010-0140R
Technician Name: JRF

MC-4085-US
Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results		Rating
	ASTM F400-04, Section 4.5.3, when tested in accordance with 8.3.	1	Adjustable premixing burner lighters, after a 5 second burn at maximum flame height:	See Below		-
		1	When extinguished in the intended manner, shall have any exposed flame completely extinguished in no more than 5 seconds.	N/A Postmixing		-
	ASTM F400-04, Section 4.5.4, when tested in accordance with 8.3.	1	Adjustable premixing burner lighters, when set at a flame height of 2 in. (50 mm) or the maximum flame height the adjustment allows, if lower than 50 mm, or nonadjustable premixing burner lighters at their permanently set flame heights, after a 10 second burn, when closed in the intended manner:	See Below		-
		1	Shall have any exposed flame completely extinguished in no more than 5 seconds.	N/A Fluid		-
Volumetric Displacement	ASTM F400-04, Section 4.6, when tested in accordance with 8.14.	1	Liquid portion of the fuel shall not exceed 85% of the volumetric capacity of the fuel chamber.	N/A		-
Drop Test	ASTM F400-04, Section 5.2.1, when tested in accordance with Section 8.4.	1	Postmixing and premixing burner lighters must be capable of withstanding three separate 5-ft. (1.5 m) drops.	See Below		-
				23°C	-10°C	
		1	Without fuel tank fragmentation.	N/A	N/A	-
		1	Without resulting in sustained self-ignition.	N/A	N/A	-
		1	Without gas escape exceeding 15 mg/min.	N/A	N/A	-
		1	Without impairing the subsequent safe operation of the lighter.	N/A	N/A	-
	ASTM F400-04, Section 5.2.2, when tested in accordance with Section 8.3.	1	Fluid lighters must be capable of withstanding three separate 5 ft. (1.5 m) drops.	See Below		-
				23°C	-10°C	
		1	Without fuel tank rupture.	M	M	PASS
	ASTM F400-04, Section 5.2.3	1	Without resulting in sustained self-ignition.	M	M	PASS



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BV Lab Number: (5106) 010-0140R

Technician Name: JRF

MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results		Rating
		1	Without impairing the subsequent safe operation of the lighter.	M	M	PASS
	ASTM F400-04, Section 5.2.3	1	Lighters that are still operable in the intended manner after testing, sections 5.2.1 or 5.2.2, shall be capable of meeting all the applicable requirements of section 4.	M		PASS
Temperature Test	ASTM F400-04, Section 5.3, when tested in accordance with Section 8.5.	1	Lighters shall be capable of withstanding a temperature of 149°F (65°C) for 4 hours.	M		PASS
		1	Lighters that are still operable in the intended manner shall be capable after return to 73 ± 4°F (23 ± 2°C) of meeting the applicable requirements in section 4.	M		PASS
Burning Test	ASTM F400-04, Section 5.4	1	Adjustable gas lighters set at maximum, nonadjustable gas lighters at their permanently set flame height, or fluid type lighters:	See Below		-
		1	Shall be capable of withstanding a burning time of 5 seconds in any hand-held attitude without evidence of any burning or distortion of components so as to cause a hazardous condition.	M		PASS
	ASTM F400-04, Section 5.4.1	1	Adjustable gas lighters set at 50 mm (2 inches) or the maximum flame height the adjustment allows if lower than 50 mm, nonadjustable gas lighters set at the permanent flame height, or fluid type lighters:	See Below		-
		1	Shall be capable of withstanding a burning time of 10 seconds in any hand-held attitude with the lighter in a position 45° below the horizontal with no burning or distortion of components so as to cause hazardous conditions.	M		PASS
Continuous Burn	ASTM F400-04, Section 5.5, when tested in accordance with Section 8.6.	1	Adjustable gas lighters, with flame set at 2 inches (50 mm) or the maximum flame height the adjustment allows if lower than 50 mm, nonadjustable gas lighters set at permanent flame height, or fluid type lighters:	See Below		-
		1	Shall be capable of withstanding a continuous burning time of 2 minutes with the flame in a vertical attitude without causing a hazardous condition.	M		PASS
Cycling Burn	ASTM F400-04, Section 5.6, when tested in accordance with Section 8.7.	1	Adjustable gas lighters, with flame set at 2 inches (50 mm) or the maximum flame height the adjustment allows if lower than 50 mm, nonadjustable gas lighters set at permanent flame height, or fluid type lighters:	See Below		-



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BV Lab Number: (5106) 010-0140R

Technician Name: JRF

MC-4085-US

Lighters (ASTM F400)

Evaluation	Citation/Method	No. Samples	Criteria	Results	Rating
		1	Shall be capable of withstanding a burning time of 20 seconds, repeated 10 times.	M	PASS
External Finish	ASTM F400-04, Section 5.7	1	Lighters shall have no external sharp edges that could cause accidental cuts or abrasions to the consumer when handled or used in the intended manner.	M	PASS
Compatibility	ASTM F400-04, Section 5.8 when tested in accordance with 8.8 and 8.9	1	Components of gas and fluid lighters that come in contact with the fuel recommended shall not deteriorate after exposure so as to fail any of the criteria herein or allow gas to escape exceeding 15 mg/minute.	M	PASS
Pressure Tests	ASTM F400-04, Section 5.9, when tested in accordance with Section 8.10.	1	Gas lighters shall be capable of withstanding an internal pressure of two times the vapor pressure occurring at 131°F (55°C) of the fuel recommended by the manufacturer.	N/A Fluid	-
Refilling of Lighters	ASTM F400-04, Section 6.1, when tested in accordance with Section 8.11 – 8.13	1	Refillable fluid lighters shall include specific instructions and warnings as applicable in accordance with section 7.	NM	DATA
	ASTM F400-04, Section 6.2, when tested in accordance with Section 8.11.	1	Refillable fluid lighters having a sealed fluid reservoir shall be free of fuel leakage from both the sealed reservoir and sealing closure.	M	DATA
	ASTM F400-04, Section 6.3	1	Refillable gas lighters shall have specific training instructions and warnings as applicable in accordance with section 7.	NM	DATA
	ASTM F400-04, Section 6.4, when tested in accordance with Section 8.13.	1	Refillable gas lighters: The refilling valve in a pressurized fuel tank lighter shall be secure enough so as not to allow an escape of gas exceeding 15 mg/min.	N/A Fluid	DATA
Certification	16 CFR 1210.3	1	Certification Showing Qualification Tests For Child Resistance Has Been Conducted Using Appropriate Surrogate Lighters And Child Panels Specified In The Regulations Must Be Submitted For Verification	NT Client Request	-

Key:

M Meets
 NA Not Applicable
 * Additional Charge For This Test
 NM Does Not Meet
 NT Not Tested
 ** Mandatory Requirement



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No. Of Samples Required For Complete Testing:	20
No. Of (Fully Packed) Cartons For Transit Testing:	1
No. Of Working Days For Complete Testing:	7

BV Lab Number: (5106) 010-0140R
Technician Name: JRF

[Client Approval:](#)

Creation Date: June 3, 2003
Editorial Revision Date: October 18, 2005
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